Impact of Neighborhood and Communities on Child Health

Geographic area of residence is associated with **exposure** to social, physical, psychological, and environmental factors that **increase the risk of developing health problems** and **decrease access to protective resources**.

General Information	
Broad Focus Area	Social Environment
Background and Justification	Health outcomes for children vary systematically across geographic areas, including small areas such as local neighborhoods as well as broader communities such as cities, town, suburbs, and rural areas. These patterns of variation are due only in part to the characteristics of the individuals and families who live in these areas; they are also attributable to systematic differences in community environments. Neighborhoods and larger communities vary in their structure, in the economic and social resources available to their residents, and in the health-related economic and social processes that occur there. Structural characteristics of communities, which include housing quality and age, land use, population density, problem conditions (e.g., noise, traffic), and demographics (e.g., age, racial, ethnic composition), influence social processes and resources available to neighborhood residents. The resources of communities include the economic, social, organization, and cultural assets that affect child health and welfare (e.g., average levels of income in the community; the quality of community organizations including schools, recreational facilities, commercial outlets, public services, and religious institutions; and employment opportunities). Community social processes often determine the degree of social interaction, crime levels, and political activity. There is a close connection between the physical and social environments in neighborhoods and communities. For example, communities that have higher incomes and more effective community and political organizations may be better positioned to create and maintain physically healthy environments. Considerable research has been conducted on the effects of neighborhoods on child and adolescent developmental outcomes. Most of this research has focused on the early childhood period and the adolescent years, and greater focus has been placed on developmental and behavioral outcomes than on health outcomes per se.[1] The great majority of research has been conducted in urban areas, and almost all has been based on observational studies. Although the identification of neighborhood effects in such studies presents difficult problems of research design, this research typically finds small, significant effects of neighborhood structure and resources on these outcomes. One experimental study, the Moving to Opportunity (MTO) study, offered a random sample of families eligible for housing assistance the opportunity to move to more affluent neighborhoods. The study found that residence in such neighborhoods improved both mental and physical health among mothers and reduced injuries, asthma attacks, and problem behaviors among children.[2] Research on the mechanisms responsible for observed neighborhood effects is still in its infancy.[1] Key questions about the impacts of neighborhoods and communities on child health remain unanswered. There are no studies of sufficient interdisciplinary complexity and size to estimate the impact of community and neighborhood factors on the incidence and complications of childhood health

	outcomes. Yet, recent publications and editorials in leading scientific journals have underscored the importance of considering these contextual factors.[3,4] Because of the need for large, representative, and prospective studies, and the consequent expense, it is unlikely that the importance of neighborhood and community factors can be adequately addressed in any study other than the proposed NCS.
Prevalence/ Incidence	Examples of variations in children's health outcomes across geographic areas include: · Among the 50 largest cities in the U.S. in 1991, infant mortality rates ranged from 5.3 per 1,000 births in Miami to 21.0 in Washington, D.C. and the percent of births to mothers who received late or no prenatal care in 1994 ranged from 2 in Honolulu to 15 in Washington DC.[5] · Social decline and moving to an urban municipality (from a rural area) were associated with preterm delivery in a national cohort of women. [6] · Asthma mortality and hospitalization vary significantly among large cities and among neighborhoods within cities. Within cities, asthma death rates are highest in areas with higher concentrations of poor people and minority residents (particularly African Americans).[7,8] Asthma prevalence is low among Mexican American children in the Southwest and high among Puerto Rican children in the East.[9] · In a study of community characteristics and blood lead levels in 20,296 children in Monroe County, New York, the overwhelming majority of those with elevated blood lead levels lived in the city. Other community-level variables associated with increased risk of elevated blood lead levels included: lower housing value, older age of housing, higher population density, higher rates of poverty, lower percent of high school graduates, and lower rates of owner-occupied housing.[10] · Cigarette smoking among adolescents 12-17 years of age is highest (18.9%) in rural counties without a city of 10,000 or more and lowest (11.0%) in central cities.[11] · Among eighteen U.S. cities that participated in the Youth Risk Behavior Surveillance System in 2001, the proportion of high school youth who rarely or never wore seatbelts was 6.7 in Los Angeles and 38.2 in Milwaukee; the proportion who currently smoke cigarettes was 11.9 in New Orleans and 24.7 in Chicago.[12] · In a seven-year study of childhood falls from windows, the incidence of falls in urban areas was four times that of surrounding non-urban areas, and Black children were three times more likely to fall than non-Black children. [13] · In an analysis of data from 1994 to 1998, the National Fire Protection Association found that residential fires and fire deaths differ by community size, with rural areas having the highest fire death rates. [14]
Economic Impact	Impact depends on the specific health or developmental outcome being examined. Interventions at the neighborhood and/or community level have the potential to affect many, therefore, public health impact can be far greater than individual-level efforts.

Exposure Measures			**Outcome Measures**	
Familial	Neighborhood and community characteristics, including: · Structure (e.g., age, racial and ethnic composition, population density, housing stocks/quality, and health status of population) · Resources (e.g., income, quality of		***Primary/ Child***	This hypothesis relates area of residence (neighborhood and community characteristics) to multiple health outcomes. For specific information on measurement issues, see hypotheses associated with:

	community organizations such as schools, recreational facilities, commercial outlets, public services, religious organizations, and employment opportunities) · Processes (e.g., of social interaction, crime levels and law enforcement, and political activity) Family's perceptions of the community and neighborhood; Residence history			· Pregnancy and birth outcomes · Neurodevelopmental and behavioral outcomes · Injury · Asthma, and · Obesity and physical development
Methods	Household surveys; Direct observation; Existing state and local data (e.g. Census Bureau data); In-depth local studies or ethnographies (optional)		Methods	Various
Life Stage	Prenatal and at moderate intervals (every two to three years) during childhood and adolescence		Life Stage	Birth through age 21

Important Confounders/Covariates	
Various depending on health outcome studied	Housing and neighborhood factors can increase or decrease the risk of health problems. For example, asthma incidence and prevalence are affected by indoor and outdoor air pollution, antioxidant constituents of diet, and repeated exposure to allergen triggers. Similar cases can be made for other outcomes, such as neurological effects, obesity, and injuries. Each health outcome is associated with an independent and unique set of covariates and confounders, although some overlap in individual factors, such as components of SES, may occur. The development of housing and neighborhood indices to reflect these characteristics will contribute significantly to testing this hypothesis.

Population of Interest		**Estimated Effect that is Detectable**
All Children		Sample size: adequate samples within areal units (e.g., an urban neighborhood or rural community) are required for multi-level modeling of community effects. It will be important to oversample diverse types of rural communities that pose special risks to child health and development.

Other Design Issues	
Ethical/Burden Considerations	Data on neighborhoods and communities need to be handled carefully so as to reduce risks of identifying specific participants.
Cost/Complexity of Data Collection	Neighborhood-level data needs to be collected, using existing resources (e.g., Census Bureau data) and possibly new data collections. The study will need this data for neighborhoods in which participants originally live and those into which study participants move over time. Measures for various types and sizes

	of geographic unit will likely be required (e.g., states, metropolitan areas, school districts, census block groups). Measuring the social environment may also involve the collection and integration of information on the local areas in which participants live; community surveys of values, attitudes, and social processes; and observational studies of schools, religious organizations, and day care centers.

References:

[1] Leventhal T, Brooks-Gunn, J. The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes. Psychological Bulletin. 2000; 126: 309-337.

[2] Katz LF, Kling JR, Liebman JB. Moving to Opportunity in Boston: Early results of a randomized mobility experiment. Quarterly J. Economics. 2001; 116: 607-654.

[3] Singer B, Ryff C (eds.). New Horizons in Health: An Integrative Approach. Washington DC: National Academy Press, 2001.

[4] Office of Behavioral and Social Sciences Research, National Institutes of Health. Toward Higher Levels of Analysis: Progress and Promise in Research on Social and Cultural Dimensions of Health, June 27-28, 2000. Bethesda, Maryland: NIH Publication No. 01-5020, September 2001.

[5] Annie E. Casey Foundation. City Kids Count: Data on the Well-Being of Children in Large Cities. Baltimore, MD: Annie E. Casey Foundation, 1997.

[6] Basso O, Olsen J, Christensen K. Study of environmental, social, and paternal factors in preterm delivery using sibs and half sibs. A population-based study in Denmark. J Epidemiol Community Health 1999 Jan;53 (1):20-3.

[7] Lang DM, Polansky M. Patterns of Asthma Mortality in Philadelphia from 1969 to

1991. NEJM, 1994; 331: 1542-1546.

[8] Carr W, Zeitel L, Weiss K. Variations in Asthma Hospitalizations and Deaths in New York City. AJPH, 1992; 82:59-65.

[9] Institute of Medicine. Clearing the Air: Asthma and Indoor Air Exposures. Washington DC: National Academy Press, 2002

[10] Lanphear BP, Byrd RS, Auinger P, Schaffer SJ. Community characteristics associated with elevated blood lead levels in children. Pediatrics 1998 Feb;101 (2):264-71.

[11] Eberhardt MS, Ingram DD, Makuc DM, et al. Urban and Rural Health Chartbook. Health United States, 2001. Hyattsville MD: National Center for Health Statistics, 2001.

[12] Centers for Disease Control and Protection. Youth Risk Behavior Surveillance - United States, 2001. MMWR. 2002; 51(No. SS-4).

[13] Stone KE, Lanphear BP, Pomerantz WJ, Khoury J. Childhood injuries and deaths due to falls from windows. J Urban Health 2000;77(1):26-33.

[14] Ahrens, M. U.S. Fire Problems Overview Report: Leading Causes and Other Patterns and Trends. Quincy, MA.: National Fire Protection Association (NFPA) International, Quincy, MA.; 2001b.